

Low-Cost Composite Technology for Large Rocket Payload Fairings, Phase I

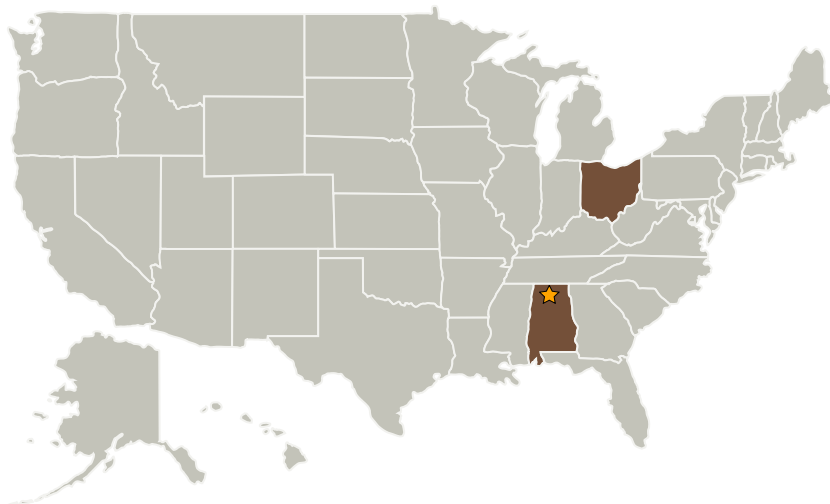
Completed Technology Project (2004 - 2004)



Project Introduction

The Commission on the Future of the U.S. Aerospace Industry states that reducing the cost to orbit is an essential ingredient for progress. This Phase I project will focus on the development of composite sandwich panel technology for large rocket payload fairings that shows promise to greatly reduce production costs compared to current large-fairing constructions. An innovative foam and fiber preform technology will be used with Vacuum Infusion Process (VIP) molding to produce high-performance, damage-resistant sandwich panel designs that enable cost reductions in tooling, materials, and processing, and that are free of the size limitations imposed by existing autoclaves. The preforms are fabricated from low-cost fiber forms and foams using high-speed, automated processes. The preforms work well with VIP molding, an environmentally friendly, non-autoclave process suitable for large, integrated structures. The orthotropic tailorability of the preforms will be exploited by using a linked local/global design analysis to achieve minimum-weight composite sandwich designs for a selected large-diameter fairing application. Sandwich panel designs will be fabricated and tested for mechanical and physical properties. The designs will be assessed by comparing structural performance and projected fairing fabrication costs against the baseline aluminum honeycomb/prepreg/autoclave technology.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Marshall Space Flight Center (MSFC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Marshall Space Flight Center (MSFC)	Lead Organization	NASA Center	Huntsville, Alabama
Webcore Technologies Corp.	Supporting Organization	Industry	Dayton, Ohio

Primary U.S. Work Locations

Alabama	Ohio
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Fredrick Stoll

Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
 - └ TX12.3 Mechanical Systems
 - └ TX12.3.1 Deployables, Docking, and Interfaces